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June 10, 1998

Document Control Desk
U. S. Nuclear Regulatory Commission
Washington, DC 20555

Docket Nos. 50-277 & 278

SUBJECT: Licensee Event Report, Peach Bottom Atomic Power Station Units 2 & 3

This LER reports a unit 2 reactor scram on November 9, 1997, resulting from a generator lockout condition and subsequent turbine trip and is being submitted pursuant to the requirements of 10 CFR 50.73(a)(2)(iv). This LER is a revision to the original submittal and discusses anomalies found with the 2A reactor feedpump turbine trip system as well as several Engineered Safety Feature actuations associated with the turbine trip.

Reference:	Docket Nos. 50-277 & 278
Report Number:	2-97-009
Revision Number:	01
Event Date:	11/09/97
Discovery Date:	11/09/97
Report Date:	06/10/98
Facility:	Peach Bottom Atomic Power Station 1848 Lay Road, Delta, PA 17314

Sincerely,
Mark E. Warner
GJL/DBB:dbb

enclosure
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WARNER,M.E. PECO Energy Co., (formerly Philadelphia Electric Co.)
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Document Control Branch (Document Control Desk)

SUBJECT: Forwards LER 97-009-01,reporting reactor scram on 971109, resulting from generator lockout condition & subsequent turbine trip.Rev to original submittal & discussion anomalies found w/2A reactor feedpump turbine trip sys.

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ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH THIS MANDATORY INFORMATION COLLECTION REQUEST: 50.0 HRS. REPORTED LESSONS LEARNED ARE INCORPORATED INTO THE LICENSING PROCESS AND FED BACK TO INDUSTRY. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE INFORMATION AND RECORDS MANAGEMENT BRANCH (T-6 F33), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Peach Bottom Atomic Power Station Units 2 & 3	05000277	1 OF 5

TITLE (4)

Unit 2 Reactor scram resulting from a generator lockout condition & subsequent turbine trip failure of the 2A Reactor Feedpump Turbine to trip on demand during recovery actvities

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAME	DOCKET NUMBER
11	09	97	97	-- 009 --	01	06	10	98		05000
									FACILITY NAME	DOCKET NUMBER
										05000

OPERATING MODE (9)	1
POWER LEVEL (10)	100

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(2)(v)		50.73(a)(2)(i)		50.73(a)(2)(viii)
	20.2203(a)(1)		20.2203(a)(3)(i)		50.73(a)(2)(ii)		50.73(a)(2)(x)
	20.2203(a)(2)(i)		20.2203(a)(3)(ii)		50.73(a)(2)(iii)		73.71
	20.2203(a)(2)(ii)		20.2203(a)(4)	X	50.73(a)(2)(iv)		OTHER
	20.2203(a)(2)(iii)		50.36(c)(1)		50.73(a)(2)(v)		Specify in Abstract below or in NRC Form 366A
	20.2203(a)(2)(iv)		50.36(c)(2)		50.73(a)(2)(vii)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
George Lengyel	(717)456-4115

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)			EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
	YES (If yes, complete EXPECTED SUBMISSION DATE).	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On November 9, 1997, with unit 2 at 100 percent power, a generator lockout and subsequent turbine trip occurred that resulted in a reactor scram. The turbine trip caused an expected high reactor pressure condition resulting in a main steam relief valve lifting and Alternate Rod Insertion (ARI) to initiation. The generator lockout resulted from problems caused during activities that swapped the 2AD003 battery charger from charger #1 to charger #2 when an equipment operator failed to appropriately follow procedure. No safety consequences occurred as a result of the scram and all safety systems were available. Corrective actions for the personnel error/procedure non-compliance were taken by the Senior Manager of Operations and reinforced with operations shift personnel. Additionally, during post-scram recovery activities, the 2A reactor feedpump turbine (RFPT) failed to trip on demand from the control room and at the local trip station. Corrective actions for the RFPT included repair, reinstallation and testing of the trip device, and an on-going analysis of the anomalies associated with the trip oil system.

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TEXT *(If more space is required, use additional copies of NRC Form 366A)* (17)

Requirements of the Report

This LER is being submitted pursuant to 10CFR50.73 (a)(2)(iv) due to multiple Engineered Safety Feature (ESF) actuations and is a revision to the original submittal.

Unit Conditions at Time of Discovery

Unit 2 was in the "RUN" mode at 100 percent of thermal reactor (EIIS:EA) power. Unit 3 was in the "RUN" mode with power increasing from 80 percent following the unit 3 eleventh refueling outage. There were no systems, structures or components that were inoperable that contributed to the event.

Description of the Event

On November 9, 1997, with unit 2 at 100 percent power, operations personnel swapped the A reactor protection system (RPS) (EIIS:JC) to the alternate power source and received the 2A battery trouble charger alarm. An equipment operator (EO) (non-licensed) was dispatched to investigate the alarm. The EO reported that a fan failure light on the 2AD003 battery charger (EIIS:BYC) was lit, although the fans inside the charger appeared to operate properly. The EO's attempts to reset the fan failure alarm were unsuccessful and per the alarm response card, the EO was directed to place the 2AD003 standby battery charger in service in accordance with SO 57B.1.A-2, "125/250 Volt Station Battery Charger Startup".

During performance of the SO, the EO did not wait the prescribed period of time for charger output voltage to ramp up to the normal operating voltage level prior to closing the DC output breaker (EIIS:BKR). When the EO closed the output breaker, the voltage was still below the normal 125 VDC level and a momentary loss of power was sensed by the generator protection relay panel and the generator field and auxiliary panel (EIIS:PL). When the DC power interruption occurred, two relays (EIIS:RLY) were aligned to the 125 VDC bus and when the charger voltage recovered to the normal 125 VDC level, both relays picked up starting a relay race. This relay race picked up a normally open contact on the generator lockout relay and when the lockout relay operated, a transfer trip signal was sent to trip the generator, resulting in a reactor scram on November 9, 1997 at approximately 1525 hours.

During the transient and reactor scram, all safety systems functioned as designed. A group II, III primary containment isolation system (PCIS) isolation occurred as expected and all systems functioned as designed. In addition, Main Steam Relief Valve RV-2-07-071C lifted and Alternate Rod Insertion (ARI) initiated, both of which are expected ESF actuations for a turbine trip event.

During the scram recovery phase the 2A RFPT (EIIS:TRB) failed to trip from the control room and at the local trip station. The 2A RFPT was successfully tripped following manual agitation of the mechanical trip device.

Cause of the Event

The cause of the reactor scram was a turbine trip resulting from a generator lockout signal. The generator lockout signal resulted from relay actuation (generator lockout relay) following momentary loss and recovery of power on the 125 VDC system from swapping the 2AD003 battery charger from charger #1 to charger #2.

The swapping of battery chargers is a task that has been performed in the past and as recently as the previous day (November 8, 1997) without incident. During the battery swapping activity on November 9, the EO read the steps of the SO and then placed the procedure aside. A caution statement in the procedure indicates that the operator must wait 15 to 20 seconds for the charger to ramp up in voltage before closing the DC output switch to prevent blowing fuses. Although the EO performed the procedure steps in the required order from memory, the EO failed to wait the prescribed 15 to 20 seconds for voltage to ramp up. By closing the DC output switch early, the EO set up a logic sequence that resulted in the turbine trip and reactor scram.

The SO procedure in use at the time was a level I procedure and required to be in hand and followed step by step during task performance. By placing the procedure aside, the EO relied on memory to perform the five steps involved with swapping the battery chargers rather than referring to each step as performed.

The cause of the 2A RFPT failure-to-trip was thought to be intermittent binding of the manual trip rod spring cup against the trip device housing caused by deformation of the cup. Inspections also revealed a slightly out-of-round manual trip rod and slight misalignment between the trip lever and trip rod connection points. The 2A RFPT failure-to-trip is similar to a previous occurrence where the same RFPT failed to trip on April 1, 1997. In that previous event, a tap on the top of the trip mechanism by personnel was also required to trip the turbine. Further analysis found that an anomaly exists within the 2A RFPT oil system that results in a 3 to 5 second delay in trip action. Investigations have determined that a momentary actuation of the trip pusbutton in the main control room does not provide a sufficient duration signal to allow full movement of the trip dump valve before the trip mechanism attempts to reset. When a trip signal is sustained, such as an actual reactor water high level, the trip dump valve moves as required and the 2A RFPT will trip.

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Analysis of Event

No actual safety consequences occurred as a result of this event. During the transient and reactor scram all systems performed as designed. However, during the scram recovery phase, other equipment problems were noted that required additional operator actions. These problems and additional operator actions were discussed in a post-scram debrief and evaluated in the plant's corrective action program. Battery charger voltages were noted to recover to normal following the event.

The rapid shutdown of all RFPTs following a scram is part of normal scram recovery actions to prevent overfeeding of the reactor vessel and possible main steam line flooding. During power operations, the high water level trip is designed to prevent cladding damage due to injection of colder feedwater.

The lifting of Main Steam Relief Valve RV-2-07-071C and the initiation of Alternate Rod Insertion (ARI) were expected ESF actuations for a turbine trip event. There were no abnormal circumstances for these ESF actuations and the equipment performed as designed.

Corrective Actions

After the scram occurred, the appropriate PCIS, ARI and RPS scram logics were reset, the SRV reseated and the affected systems were rest to the appropriate configuration.

The equipment operator was counseled on the correct use of level I procedures by the Senior Manager of Operations. In addition, information regarding this event was disseminated to operations shift personnel including reinforcement of the expectation for use of procedures, including level I in accordance with A-C-79, Procedure Adherence and Use.

The RFPT trip device was repaired, reinstalled and tested to prove operability. A root cause evaluation is on-going to determine the cause of the anomaly, and to determine appropriate changes to maintenance practices or programs including testing.

The generic implications of a similar anomaly on the other five RFPTs has been evaluated and determined to be unlikely. A review of past equipment performance indicates the other turbine trip devices have been very reliable. The other unit 2 RFPTs were successfully tripped after the reactor scram on November 9, 1997. The unit 3 RFPTs were successfully tripped during the recent forced outage on November 28, 1997. In addition, the Unit #3 RFPTs were tripped successively and were inspected during a planned plant shutdown (3J12) in March, 1998. This provides reasonable assurance that a similar deficient condition does not exist on these RFPTs.

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Previous Similar Events

There were no previous events identified where swapping battery chargers resulted in a reactor scram.

The failure of the 2A RFPT to trip on a momentary signal from the MCR pushbotton is similar to an event on April 1, 1997. At the time of the original LER submittal (December 9, 1997), it was believed that mechanical binding of some trip mechanism sub-components caused the failure to trip. The original failure disposition also stated that the binding condition was the most likely cause of the April 1, 1997 event. Further investigation in early 1998 indicated the binding condition noted during bench testing could not be duplicated in the field and would not have prevented the 2A RFPT from tripping. The original failure cause evaluation of November 1997 has been determined to be incorrect due to troubleshooting and investigating to the depth of the symptoms noted at the time.